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REMOVAL *of* APPLE TREES

OHIO AGRICULTURAL EXPERIMENT STATION
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REMOVAL OF APPLE TREES

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Orchard A, consisting of 7 acres of apples at the Ohio Agricultural Experiment Station, was planted in 1893. At the end of the fiftieth season it was decided to remove most of the trees in this orchard. Records were kept of the time consumed in the removal of the trees and brush, as well as for the sawing of the cord wood.

In the following pages of this circular, a pictorial record of the various operations incident to the removal of these trees is presented. Observations are also presented on the removal of younger trees.

Orchard A was originally planted as a variety trial orchard, and several hundred varieties were tested during the 50 years. Some of the original trees had been removed earlier and other trees planted in their places. Most of the original trees were large trees; the diameters of the trunks ranged from 14 inches in the case of Wealthy to 27 inches for some large-growing varieties, like Baldwin, White Pippin, and Rhode Island Greening. The average diameter of these 50-year-old trees was 20.7 inches. The tops of the trees occupied practically the entire space between trees, which was 33 by 33 feet.

Most of these 50-year-old trees were in relatively good vigor as was evidenced by the dark green foliage, but many of the trunks were partially hollow and the wood was rather brittle. The conditions were typical of an orchard of this age which had been given good cultural care throughout its life. For the most part the trees had an extensive and deep root system.

It was desired to replant this site to an orchard within 2 or 3 years, and, hence, it was necessary to remove as many of the roots as possible. The old trees were too brash to withstand removal by block and tackle without incurring heavy breakage of limbs and trunks. Moreover, cleaning the dirt from the roots of the trees removed either by direct pull or block and tackle is a considerable task.

It was, therefore, decided to use dynamite to assist in removing most of the larger trees. An expert workman, familiar with the use of dynamite, was employed to set the dynamite charges. The rest of the labor was supplied by the regular orchard force of men. A total of 153 trees was removed; of these 103 ranged in age from 35 to 50 years and 50 of the trees were younger. The time consumed in the process of removing these trees, as well as the cost, is shown in table 1.

In blowing out 153 trees, 295½ pounds of dynamite were used, an average of 1.9 pounds per tree. On the larger trees 2½ to 3 pounds were used. Fuse cap exploders with wire attachments 6 feet long, rather than the powder fuse, were used to explode the dynamite. The work was done during the winter months when the soil was moist. The fuse cap exploders were fastened to a two-way insulated wire circuit about 100 feet long. When the charge was in readiness, the other ends of these wires were placed in contact with the poles of a second-hand automobile battery. The explosion occurred instantaneously. The fuse cap exploders were considered safer and also more dependable than the powder fuse.

TABLE 1.—Cost of removing 153 apple trees in Orchard A, 1942-1943

	Number of hours	Rate	Total cost
Expert blaster	47½	$0.90	$ 42.75
Miscellaneous labor	1204	.45	541.80
Tractor for pulling stumps and trunks	43	.50	21.50
Tractor for buzzing cord wood	28	.50	14.00
60% dynamite, 295½ lb.		.30	88.65
Fuse cap exploders, 200		.08	16.00
Total cost of removing 153 trees (5 acres)			724.70
Credit for 200 cords of wood @ $2.00			400.00
Net cost of removing trees and clearing land ready for plowing			324.70
Cost per acre			81.19
Cost per tree			2.12

There is comparatively little danger attached to this type of use of dynamite; however, the average workman is not familiar with methods of using it, and it is generally safer to have someone skilled in its use to set the charges and attach the fuses.

REMOVING YOUNGER TREES

Apple trees used for fillers between permanent trees are generally removed by the eighteenth or twentieth growing season. Such trees can be removed with a tractor, using a direct pull. For older trees it is usually necessary to use either a block and tackle hitch or dynamite.

Data on the cost of removal of filler trees at the Ohio Agricultural Experiment Station have been presented previously.[1] The cost per tree for removing 16-year-old filler apple trees was 70 cents; for removing plum trees ranging from 21 to 29 years old it was 78 cents per tree.

It is evident that the use of dynamite adds appreciably to the cost of removing trees, but at least part of the additional cost for the dynamiting is offset by the fact that the roots of dynamited trees are much freer from soil than those pulled by tractor. The use of dynamite, to some extent at least, facilitates the preparation of the land for the growing of cover crops. In the case of apple trees growing on Wooster silt loam or, in fact, on any type of soil which permits deep rooting, dynamite would seem to be practical for removing trees more than 25 years old. Younger trees can be more economically removed by the use of a tractor.

FIREWOOD FROM APPLE TREES

A part of the cost of tree removal can sometimes be offset by utilizing the trunks of the trees and the larger limbs for firewood. Apple wood makes excellent fuel for burning in open grates or fireplaces.

The 50-year-old trees removed from Orchard A provided a large quantity of good sized wood. Approximately 200 face cords of firewood were salvaged from the 153 trees removed. A face cord in this instance consisted of a stack of wood cut into 19 to 20 inch lengths, 8 feet long and 4 feet high. This wood sold at the rate of $2 per face cord in the orchard.

[1]Ellenwood, C. W. 1941. The Cost of Removing Fruit Trees. Ohio Agr. Exp. Sta. Bimo. Bull. 209, pp. 209-30.

REFITTING AN OLD ORCHARD SITE FOR REPLANTING TO TREES

A proven favorable site for an orchard is the first essential in successful fruit growing. When an orchard site has demonstrated its adaptability, it is desirable that it be returned to orchard as quickly as possible when the trees are finally removed.

After the trees were removed from this 50-year-old orchard, as shown in the illustrations, the land was plowed with little difficulty with a tractor. Lime was added at the rate of 3 tons per acre, and then, having been properly fitted, it was seeded to soybeans. The cost of refitting the land is not included in this discussion.

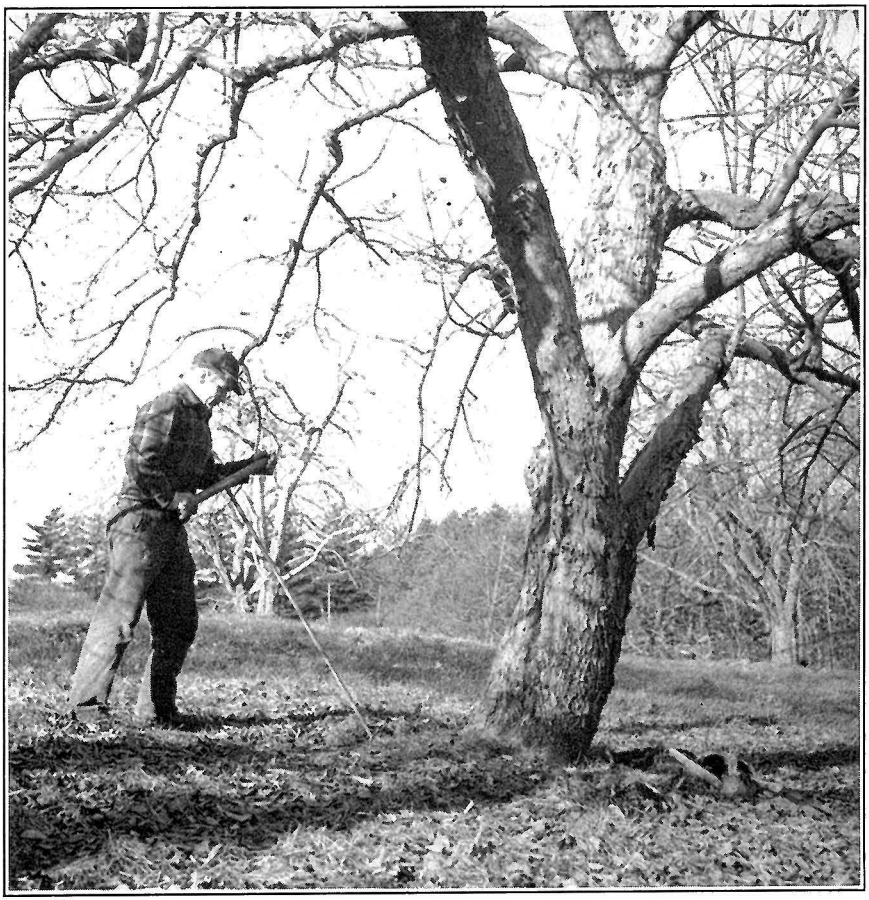

Fig. 1.—Boring one or more holes slantwise under the tree is the first operation in dynamiting trees. The hole should be about 2½ inches in diameter. An iron bar in addition to the auger can be used to good advantage in making the hole.

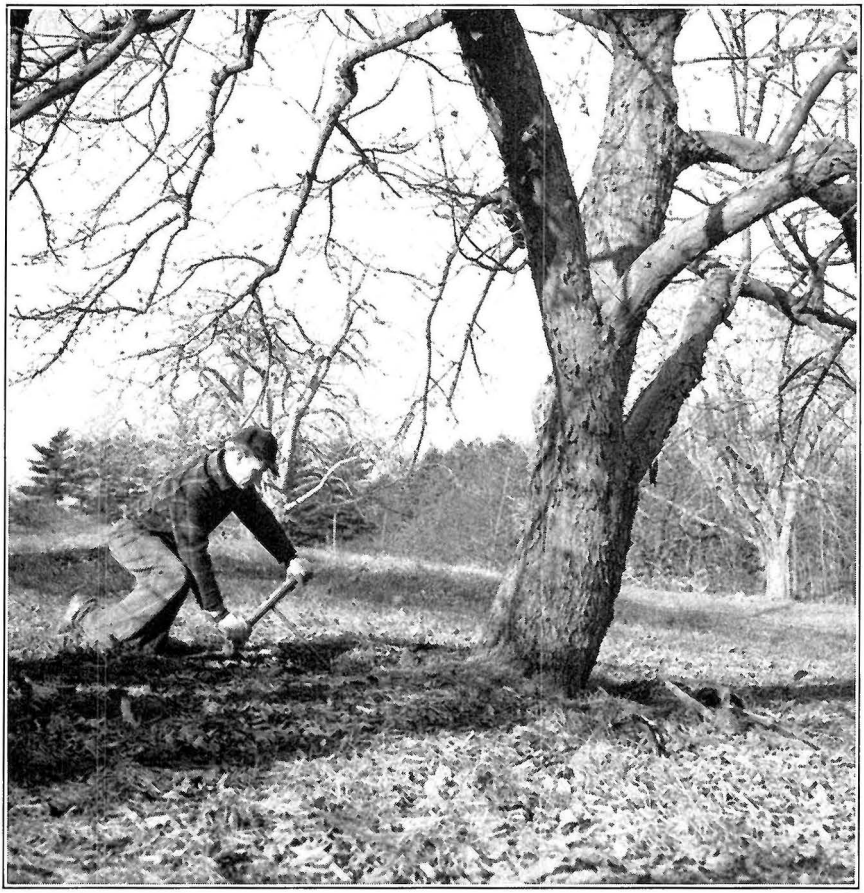

Fig. 2.—The bottom of the hole must be under the heart of the tree. On large trees this means that the hole will be at least 3 feet deep. Occasionally, it may be necessary to place a light shot under a tree to make a large enough aperture for the full charge of dynamite, when large roots interfere with the drilling of the hole.

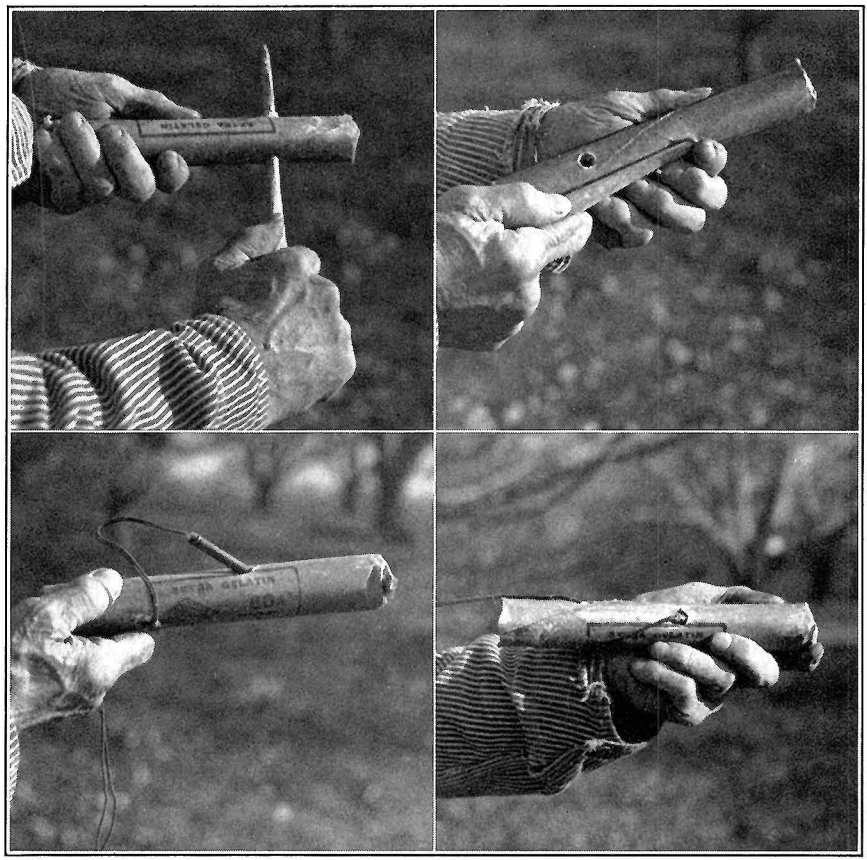

Fig. 3.—After the hole is prepared the next step is inserting fuse cap in dynamite stick. Fuse is attached to only one of the dynamite sticks.

A pointed wood punch is used to make the holes in the dynamite for insertion of cap. The wired fuse caps are more satisfactory and safer for work of this kind than the powder fuse.

Upper Left—A hole is made through the dynamite stick near one end
Upper Right—A hole is made into but not through the stick slantwise.
Lower Left—The cap is then inserted in the dynamite stick to the full length of the cap.
Lower Right—The end of the wire is then pulled through the crosswise hole.

Fig. 4.—The dynamite stick with cap and fuse wire attached is placed in the hole first and then additional dynamite as may be required to blow out the tree is placed in the hole. In this operation a wooden instrument such as a hoe or fork handle is used to force the dynamite into place. This operation requires care on the part of the operator, but the hazard is more apparent than real.

When the dynamite has all been inserted in the hole the soil is tamped into the hole to seal out the air. 75 to 100 feet of two-way insulated electric wire are attached to the fuse at one end, and then contact with the points on an automobile battery is made at the other end. The explosion occurs instantaneously.

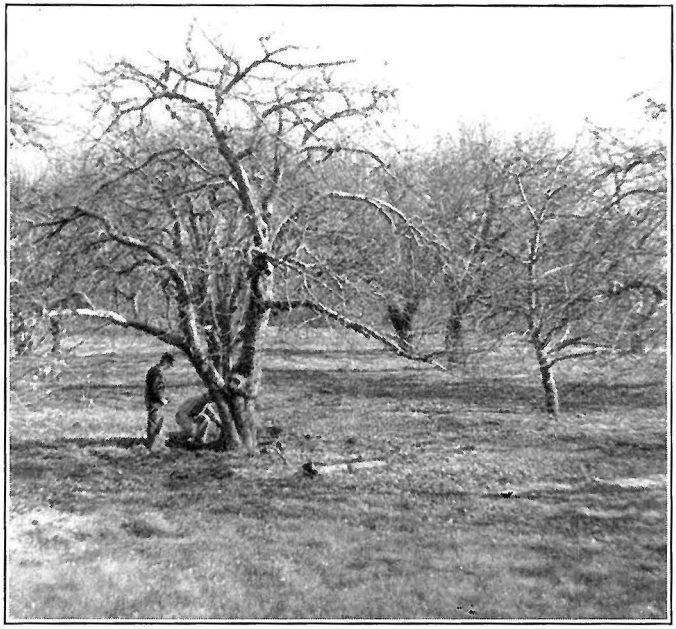

Fig. 5.—Tamping the soil over the dynamite.

Fig. 6.—The explosion of from 2 to 3 pounds of dynamite beneath a large tree is quite violent; it is wise for workmen to take cover behind a tree 100 feet or more from the tree being dynamited.

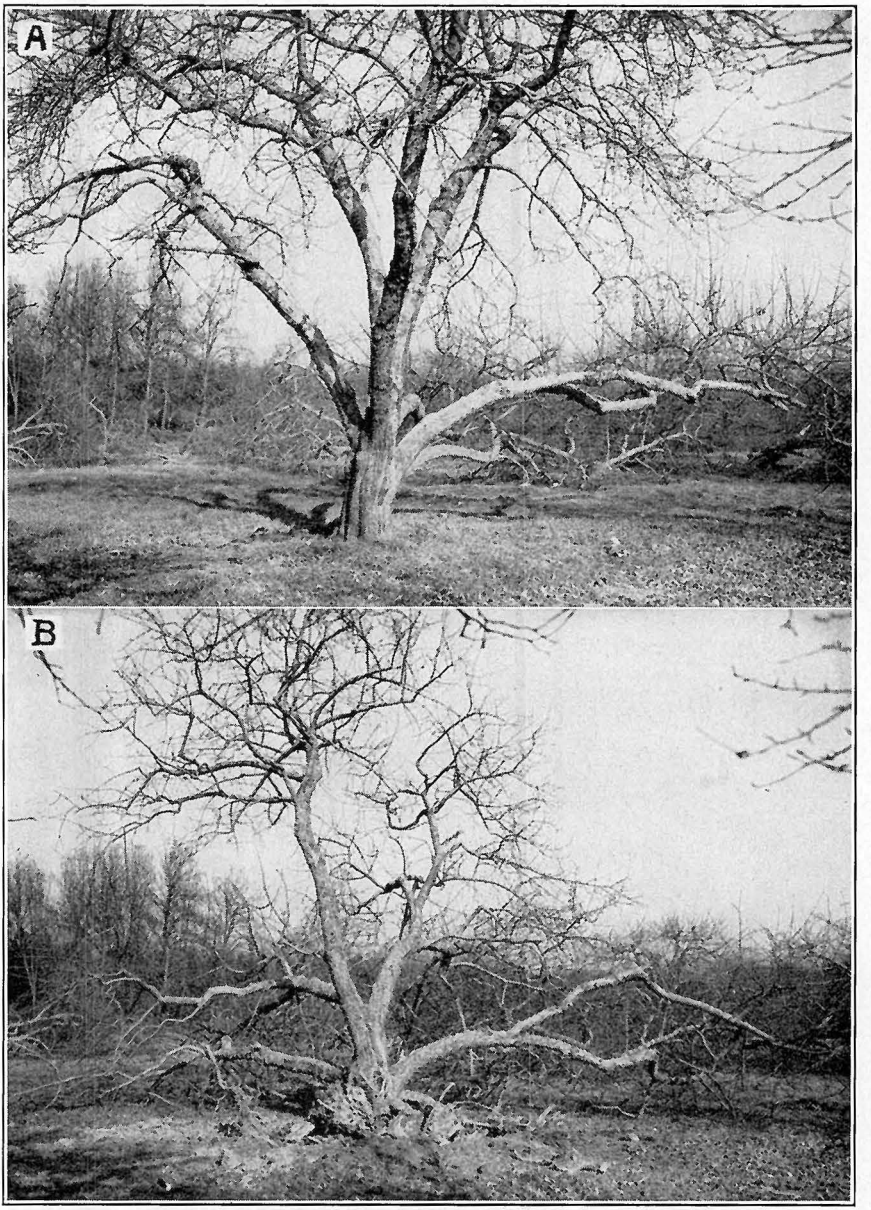

Fig. 7.—A—A sturdy 50-year-old apple tree before dynamiting. Note effect of dynamiting (B).

B—The same 50-year-old apple tree shown in A after 3 pounds of dynamite had been exploded beneath it. The tree is lying on its side ready to be trimmed. Large limbs are used for firewood; brush is burned.

Fig. 8.—If the tree is decayed at the heart, the dynamite shock may shatter the base of the tree. In such cases a tractor will readily pull the tree out.

Fig. 9.—If the charge is heavy enough and has been properly planted beneath the tree, quite large trees can be blown clear of the ground.

Fig. 10.—A 25-year-old tree which has been blown out with 2 pounds of dynamite. Note the absence of soil on the roots.

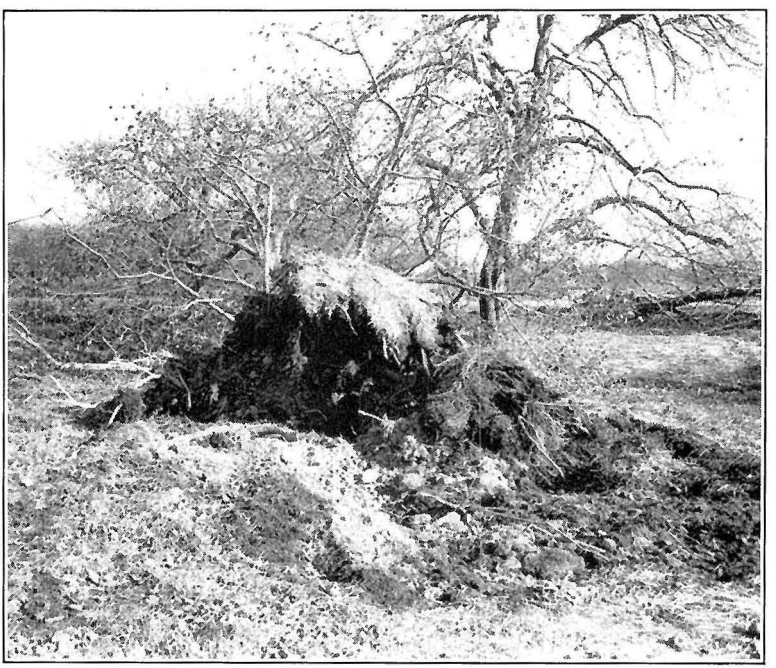

Fig. 11.—A 20-year-old apple tree pulled out with a tractor. Note the heavy accumulation of soil on the tree roots.

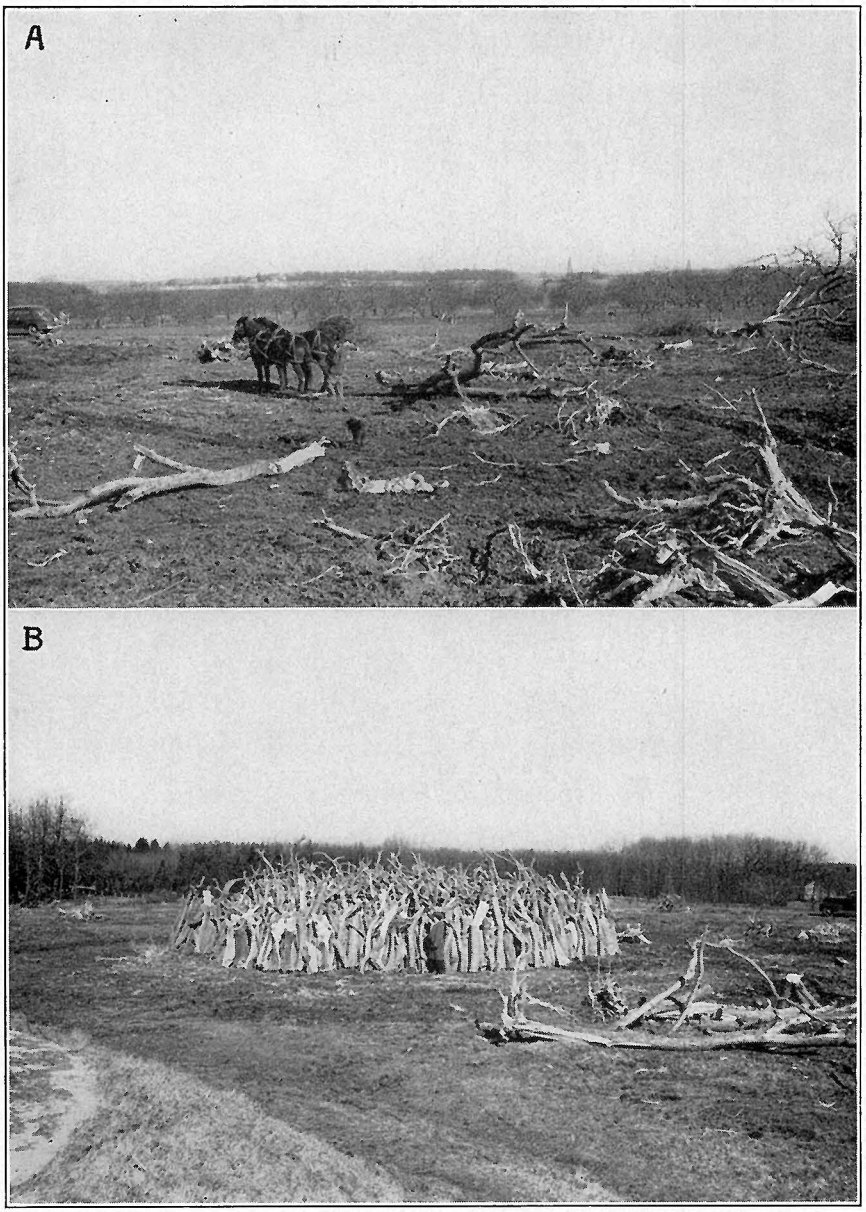

Fig. 12.—A—After fine brush and smaller limbs are burned, the larger limbs are dragged to a central point preparatory to sawing into firewood.

B—Limbs are systematically stacked ready for the buzz saw.

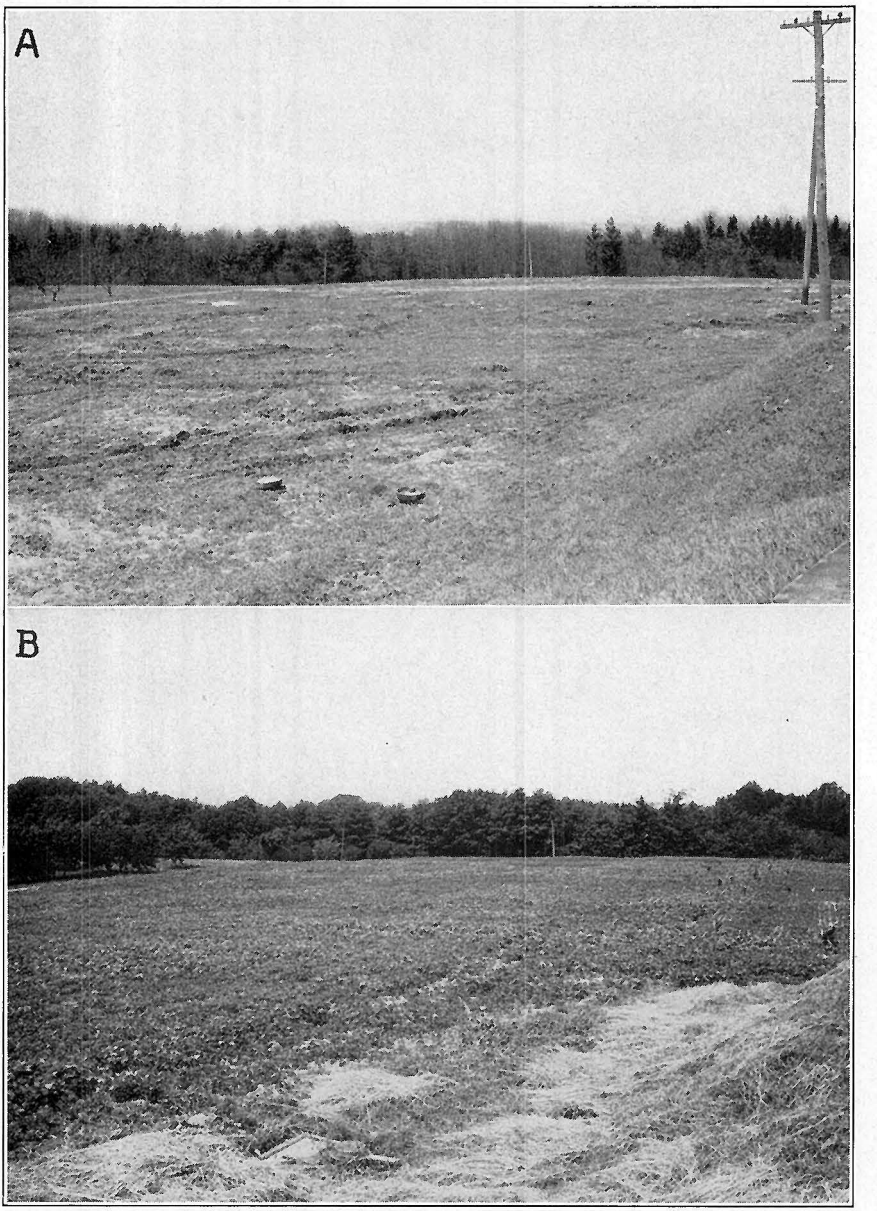

Fig. 13.—A—Showing the orchard area cleared of stumps and roots and ready for plowing.

B—Soybeans growing on area formerly occupied by orchard. Soybeans will be followed by rye for a winter cover crop. With similar soil management for 3 or 4 years this area can again be replanted to orchard.

Fig. 14.—A 35-year-old apple tree being removed by means of tractor with block and tackle hitch. A tree this age cannot be removed by direct pull, and in using the block and tackle hitch there is danger of shattering the tree top and of upheaval of large quantities of soil.

Many apple trees should be removed by their thirty-fifth year. Trees older than this are generally less profitable than younger trees. Pruning, spraying, and harvesting costs tend to increase on older trees. Likewise the quality of the fruit on older trees is not as good as that from trees 15 to 30 years old.

Fig. 15.—Pulling 11-year-old apple trees by direct hitch. Trees this age can be quickly removed by this method.

Fig. 16.—A block of 16-year-old apple trees which has been thinned by pulling the filler trees with tractor using a direct hitch. These trees are nearing the age limit when they can be removed by direct pull.